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# **Bronchoprovocation testing for diagnosis of EIB in Athletes:**

## **Is one test enough?**

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**Background:** Exercise-induced bronchoconstriction (EIB) is highly prevalent in athletes and impacts on their health and performance. The gold-standard means for diagnosing EIB is indirect bronchoprovocation testing, however the repeatability of this methodology is not established. **Aims and objectives:** To evaluate the short-term test-retest repeatability of eucapnic voluntary hyperpnea (EVH). **Methods:** Twenty-five recreationally active men ( $n=21$ ) and women ( $n=4$ ) were recruited. Participants were required to attend on two separate occasions separated by a period of fourteen days. Participants performed spirometry before and following (at 3,5,10 and 15 mins) an EVH challenge (6 minutes at 85% maximum voluntary ventilation). Difference in forced expiratory volume in one second ( $FEV_1$ ) between visits was analysed using Bland-Altman methodology. **Results:** 22 subjects completed both visits ( $n=3$  excluded - unwell), mean (SD) age 25 ( $\pm 4$ ) yrs,  $FEV_1$  102 ( $\pm 8.6$ ) % predicted. There was no significant difference in maximum fall in  $FEV_1$  post EVH between visits ( $P>0.05$ ), however Bland-Altman analysis revealed wide limits of agreement (-10.36-7.9%) for the difference in fall in  $FEV_1$  between visits. A diagnosis of EIB ( $>10\%$  fall in  $FEV_1$ ) was established in two athletes at visit one whereas this increased to five athletes at visit 2. Importantly, only one athlete had a diagnosis of EIB confirmed at both visits. **Conclusion:** In this cohort of athletes EVH demonstrated poor repeatability over a fixed two-week period. The findings highlight the need for caution when considering confirming or refuting a diagnosis of EIB based on a solitary indirect bronchoprovocation test and a cut-off value of 10% fall in  $FEV_1$ .